IN THE CLAIMS:

Amendments to the Claims

Please cancel claims 6-8, which are subject to a restriction requirement, without prejudice or disclaimer of the subject matter thereof and without prejudice to the filing of a divisional application directed thereto.

Listing of Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1.   (original) A numerically controlled curved-surface machining unit equipped with three linearly moving axes and, at least, one rotary axis, including a simultaneous multiple-axis control NC machine numerically controlled by a numerical control unit with a numerical control NURBS interpolation function, comprising:

component converting matrix-angle-addition value forming means for converting CL (cutter location) data composed of tool control point vector data and tool axis vector data, calculated along a machining direction on a workpiece coordinate system on which a curved surface is defined by a host computer into components on a normal coordinate system for operating said simultaneous multiple-axis control NC machine on the basis of the machine configuration of said simultaneous multiple-axis control NC machine;

component converting means for converting from the workpiece coordinate system to the normal coordinate system;

second angle forming means for forming second angles of a second rotary axis on the normal coordinate system;

second angle compensating means for forming a continuous angle distribution from a distribution of the second angles;

first angle forming means for forming first angles of a first rotary axis on a coordinate system rotated by the second angles at the second rotary axis;

first angle compensating means for forming a continuous angle distribution from a distribution of the first angles;

machine coordinate transformation matrix forming means for obtaining a matrix for converting the tool control point vectors on the workpiece coordinate system into a machine coordinate system by using said first angles and said second angles;

machine coordinate converting means for converting the tool control point vectors into the machine coordinate system by using said machine coordinate transforming matrix;

means for converting data on the machine coordinate system to NC data; and

means for transmitting said NC data to said numerical control unit.

2.   (original) A numerically controlled curved-surface machining unit according to claim 1, wherein said component converting matrix·angle addition value forming means reads, as said machine configuration, data relating to the first rotary axis, the second rotary axis, a tool axis and a master axis and forms a component converting matrix converting components to the normal coordinate system, axis conversion matrix and angle addition values, and said component converting means converts the tool axis vectors into normal coordinate system components by using the component converting matrix, the axis converting matrix and the angle addition values.

3.   (original) A numerically controlled curved-surface machining unit according to claim 1, wherein said second angle compensating means sets an identifier by detecting the condition that both vectors for obtaining angles become 0,

obtains a difference value of adjacent angles, forms another difference value using the difference value of adjacent angles in the case where any angle is not obtained by said identifier, detect, when said difference value is larger than π, a minimum value from said difference value, said difference value $+\pi$, said difference value $-\pi$, said difference value $+2\pi$, and said difference value -2π to set the minimum difference value as a new difference value, and obtains the second angle by adding the difference value to an angle of a start point.

4.   (original) A numerically controlled curved-surface machining unit according to claim 3, wherein said first angle compensating means detects, when said difference value is larger than π, a minimum value from said difference value, said difference value $+2\pi$ and said difference value -2π to set the minimum difference value as a new difference value, and obtains the first angle by adding the difference value to the angle of start point.

5.   (original) A numerically controlled curved-surface machining unit according to any one of claims 1 to 4, wherein said first angle forming means forms a reference direction vector of said first angle by using said second angle, and obtains the first angle the start of which is said reference vector.

Claims 6-8 (canceled)